



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

would in lapse of time culminate, till it had reached a proportion when obvious mechanical difficulties would more than balance the advantages resulting from superior size and vigor, and when, therefore, farther disproportion would be arrested. It may be added that the like disproportion of the sexes in the forms above enumerated furnishes not the slightest evidence of more intimate primordial affinity, for like causes would in each special case, such as this, produce like effects."—THEODORE GILL.

Errata of article on Chromatophores in fish embryos in February NATURALIST: Page 113, 9 lines from bottom, read oviparous for viviparous; page 114, 15 lines from top, read periblast for epiblast; page 116, 16 and 29 lines from top, read periblast for epiblast; page 117, 25 lines from top, read periblast for parablast; page 118, 2 lines from bottom, read *Hemirhamphus* for *Hemisbampus*.—C. H. EIGENMANN.

EMBRYOLOGY.¹

The Later Larval Development of Amphioxus.²—Mr. Arthur Willey has published a most interesting account of the later stages of the larval Amphioxus. It is a continuation of a preceding paper by Professor Lankester and himself on the younger larva. In the first paper the larva, with its large mouth on the left side and the single row of gill-slits on the right, was described; also the structure and position of the club-shaped gland and the endostyle were given, and the origin of the atrial folds. In the present account the author begins with a larva having fourteen primary gill-slits arrayed in a single row, and all on the right wall of the pharynx. Above these and on the same side is to be seen a thickened rod of endodermal tissue with six swellings. These later break through to form six secondary gill-slits, second to seventh inclusive. The atrium is still open in front. The posterior primary gill-slits now begin seriatim to close and atrophy, beginning with the fourteenth and continuing until but eight remain. At the same time this primary row of gill-slits begins to move around the ventral surface to the opposite side of the larva (the left), where they assume their adult position. Meanwhile the secondary gill-slits increase in number and size, and occupy the right side of the

¹ Edited by Dr. T. H. Morgan, Johns Hopkins University, Baltimore, Md.

² *Quart. Jour. Micro. Sci.*, March, 1891.

embryo. A single anterior (to the six) slit appears, and others are also added behind the first-formed slits, ultimately the number of eight secondary gill-slits being formed. There is then a pause for a time in the formation of slits, and much later the tertiary slits appear behind on each side, and the number goes on increasing during life.

While these changes have been taking place in the gill region other important organs have been modified. The mouth has moved from its left lateral position to the mid-ventral line, and the oral hood with its buccal cirri has appeared. The V-shaped endostyle, at first high up on the right wall of the pharynx, moves as the primary gills move, from right to left, as far as the middle line, and at the same time the arms of the V become parallel, and the apex grows backwards between the gill-slits. The club-shaped gland, which communicates both with the cavity of the pharynx and the outer world, atrophies, and at the same time also the first primary slit. For this or other reasons the author believes the club-shaped gland to be a modified gill-slit,—the first of the secondary ones.

In the theoretical part of the paper the asymmetry of the larva, the change of position of the endostyle, and the homologies of the club-shaped gland, are discussed. Interesting as this excursion is, it cannot be given here at all fully. It is assumed that the ancestral *Amphioxus* had a mouth opening in the mid-dorsal line, and that the growth forward of the notochord caused this to shift to the left side. At the same time the whole pharynx became twisted to the right, corresponding to the movement of the mouth, so that the proper gill-slits of the left side were carried around to the right side. Consequently when these (the primary) appeared the gill-slits belonging to that side (right and secondary) were for a time retarded in development; hence the asymmetry of the larva.

Several sections deal with the homologies between the Ascidian tadpole larva and *Amphioxus*, and the startling conclusion is reached that the intestine of the Ascidian is not homologous with the intestine of *Amphioxus*, but is to be compared to the club-shaped gland, and therefore represents the modified first right (secondary) gill-slit of *Amphioxus*.

Development of the Pancreas in Batrachia.—The origin of the pancreas in both Urodeles and Anurans has been studied anew by Göppert.³ In the embryos of both groups the pancreas arises by three evaginations from the intestine. One of these is from the dorsal surface; the other two from the sides, right and left. The

³ *Morph. Jahrbuch*, XVII. Band, 1st Heft, 1891.

cells of these evaginations fold in and form the tissues of the pancreas. The three portions separated at first subsequently fuse into a single organ. The three openings into the gut, however, undergo several changes. In the adult Urodeles there is a forward opening for the pancreatic gland into the intestine near to the pylorus. This comes from the dorsal evagination of the embryo. There are in the adult Urodeles two or more other openings behind this, some of which fuse with the duct from the liver (ductus choledochus). The posterior openings result from various combinations of the two ventral (right and left) evaginations. In the Anuran the adult has no anterior opening of the pancreas near the pylorus. In the embryo, however, there is one (the dorsal), as in the Urodeles, but it is subsequently lost. The two ventral (or side) evaginations unite with one another and form a single opening, which subsequently fuses with that of the ductus choledochus, as in the adult.

Embryology of Glires.—M. Duval has published another of his series of papers on the development of rodents, entitled, “*Le Placenta des Rougeurs.*”⁴ The young stages of the mouse are described. Sections through the whole gravid uterus were made in most cases. The earliest stage described had a single layer of ectoderm cells surrounding a central cavity. Underneath one portion of this layer were a very few large granular amoeboid-like cells, which subsequently spread out beneath the ectoderm to form the endodermal lining of the vesicle. Above this portion in later stages the ectoderm thickens greatly, resulting in a solid plug in which a cavity subsequently appears to form the cavity of the amnion and the ectoplacenta. The relation subsisting between this ectoplacenta and the allantois on the one side and the uterine walls on the other form the substance of the latter part of the paper. The problem of the inversion of the layers in the mouse and rat were discussed in a preceding paper (see abstract in *AMERICAN NATURALIST* for April, 1891).

⁴ *Journal de l'Anatomie et Physiologie*, Jan.-Feb., 1891.